

# GEORGETOWN

**water pollution  
control plant**

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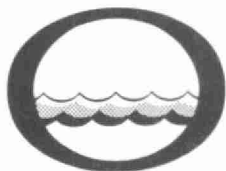
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*Water management in Ontario*

Ontario  
Water Resources  
Commission

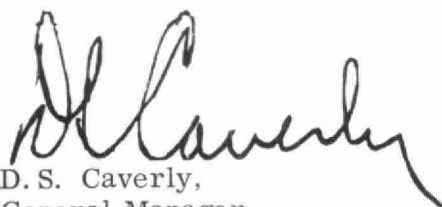
135 St. Clair Ave. W.  
Toronto 7  
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.


Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.



D. S. Caverly,  
General Manager.



D. A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.

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**GEORGETOWN**  
**water pollution control plant**

operated for

THE TOWN OF GEORGETOWN

by the

ONTARIO WATER RESOURCES COMMISSION

**1968 ANNUAL OPERATING SUMMARY**

## FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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## **'68** REVIEW

The operating cost for the year was \$43,308.19, an increase of \$924.94 over 1967. The unit cost for treating one million gallons increased from \$65.19 in 1967 to \$80.29 in 1968.

In 1968 the plant treated an average flow of 1.47 mgd, which represents 98 percent of the design flow of 1.5 mgd. This design flow was exceeded 56 percent of the time during the year.

Reductions of 84 percent in BOD and 96 percent in suspended solids were experienced in 1968 in comparison to 87.1 percent in BOD and 89.7 percent in suspended solids in 1967. The average raw sewage strength was 84 mg/l for BOD and 250 mg/l for suspended solids. Raw sewage strength in 1967 was 85 mg/l for BOD and 233 mg/l for suspended solids.

The average final effluent BOD and suspended solids concentrations of 13 mg/l and 11 mg/l respectively were within the OWRC objectives.



## PROJECT COSTS

|  |           |                  |                     |
|--|-----------|------------------|---------------------|
| NET CAPITAL COST (Final)   | 2-0017-58 | \$871,677.01     |                     |
| DEDUCT payments from Municipalities                                    |           | <u>48,379.33</u> |                     |
| Long Term Debt to OWRC   |           |                  | \$823,297.68        |
| NET CAPITAL COST (Final)   | 2-0077-61 | \$ 63,230.31     |                     |
| DEDUCT Portion Financed by<br>CMHC (Final)                             |           | <u>19,072.10</u> |                     |
| Long Term Debt to OWRC   |           |                  | <u>44,158.21</u>    |
| Total Long Term Debt to OWRC   |           |                  | <u>\$867,455.89</u> |
| Debt Retirement Balance at Credit<br>(Sinking Fund) December 31, 1968: | 2-0017-58 | \$165,096.40     |                     |
|  | 2-0077-61 | <u>6,574.48</u>  | <u>\$171,670.88</u> |

|                  | <u>2-0017-58</u>    | <u>2-0077-61</u>  | <u>TOTAL</u>        |
|------------------|---------------------|-------------------|---------------------|
| Net Operating    | \$ 43,308.19        | \$ 50.07          | \$ 43,358.26        |
| Debt Retirement  | 16,614.00           | 891.00            | 17,505.00           |
| Reserve          | 4,703.97            | 332.16            | 5,036.13            |
| Interest Charged | <u>46,222.76</u>    | <u>2,479.18</u>   | <u>48,701.94</u>    |
|                  | <u>\$110,848.76</u> | <u>\$3,752.41</u> | <u>\$114,601.33</u> |

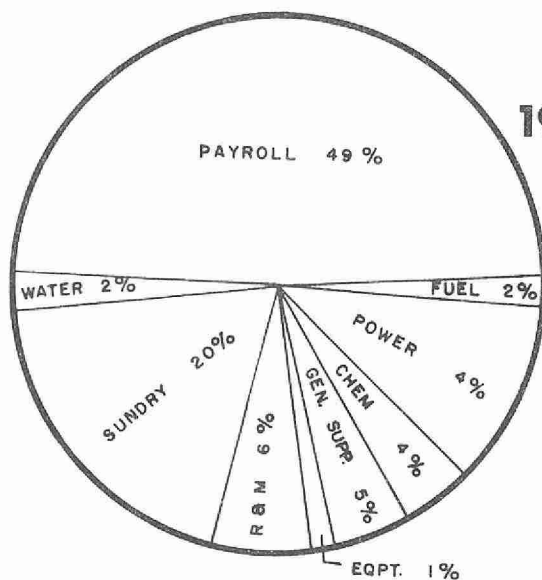
RESERVE ACCOUNT

|                             | <u>2-0017-58</u>   | <u>2-0077-61</u>  | <u>TOTALS</u>      |
|-----------------------------|--------------------|-------------------|--------------------|
| Balance @ Jan. 1, 1968      | \$38,620.64        | \$2,659.52        | \$41,280.16        |
| Deposited by Municipalities | 4,703.97           | 332.16            | 5,036.13           |
| Interest Earned             | <u>2,297.28</u>    | <u>164.71</u>     | <u>2,461.99</u>    |
|                             | \$45,621.89        | \$3,156.39        | \$48,778.28        |
| Less Expenditures           | <u>4,511.14</u>    | <u>-</u>          | <u>4,511.14</u>    |
| Balance @ Dec. 31, 1968     | <u>\$41,110.75</u> | <u>\$3,156.39</u> | <u>\$44,267.14</u> |

## Monthly Operating Costs

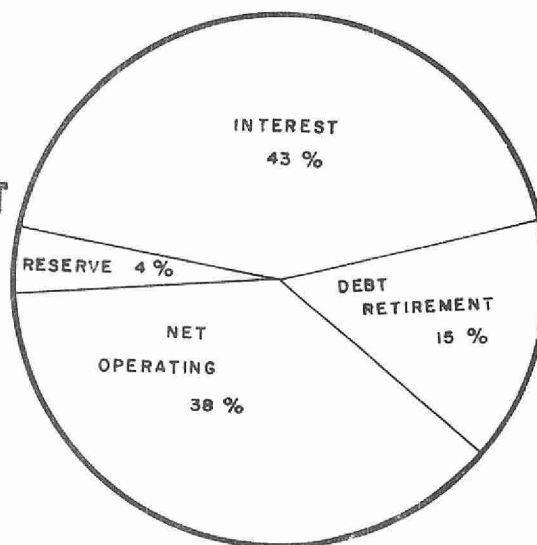
| MONTH | TOTAL<br>EXPENDITURE | PAYROLL  | CASUAL<br>PAY ROLL | FUEL   | POWER   | CHEMICAL | GENERAL<br>SUPPLIES | EQUIPMENT | REPAIRS &<br>MAINTENANCE | * SUNDRY | WATER | TRAVEL |
|-------|----------------------|----------|--------------------|--------|---------|----------|---------------------|-----------|--------------------------|----------|-------|--------|
| JAN   | 1526.56              | 1402.62  | -                  | 44.90  | -       | -        | 27.75               | -         | 25.00                    | 26.29    | -     | 55.72  |
| FEB   | 2787.86              | 1392.73  | -                  | 159.93 | 448.81  | 238.61   | 176.74              | -         | 277.86                   | 37.46    | -     | 57.40  |
| MAR   | 3741.62              | 2217.84  | 187.07             | 91.69  | 462.11  | -        | 66.16               | 44.22     | 23.52                    | 591.61   | -     | 95.48  |
| APRIL | 3421.32              | 1400.85  | -                  | 90.94  | 439.55  | 238.61   | 167.13              | -         | 338.16                   | 642.60   | -     | 61.08  |
| MAY   | 3714.11              | 1392.73  | 49.21              | 17.20  | 394.21  | 214.74   | 241.28              | 29.40     | 132.41                   | 1181.05  | -     | 95.20  |
| JUNE  | 4787.45              | 1408.12  | 230.28             | 68.62  | 412.33  | 238.61   | 320.13              | 359.06    | 477.39                   | 1177.71  | -     | 80.08  |
| JULY  | 2621.19              | 1378.22  | 312.74             | -      | 384.77  | -        | 170.34              | 20.71     | 184.02                   | 90.30    | -     | 100.38 |
| AUG   | 5081.99              | 1464.48  | 1134.23            | -      | 329.67  | 238.61   | 208.35              | 99.89     | 219.87                   | 1286.51  | -     | 100.00 |
| SEPT  | 2225.76              | 983.85   | 286.55             | -      | 350.25  | 238.61   | 153.67              | 22.49     | 43.23                    | 47.11    | -     | 27.15  |
| OCT   | 2560.05              | 991.17   | 311.58             | -      | 32.33   | -        | 106.09              | 26.00     | 304.47                   | 761.26   | -     | 95.55  |
| NOV   | 4039.24              | 1413.66  | 142.94             | -      | 631.49  | 238.61   | 140.78              | -         | 88.29                    | 1287.92  | -     | 163.27 |
| DEC   | 6801.05              | 2994.19  | -                  | 255.50 | 903.15  | 238.61   | 282.69              | 25.00     | 503.80                   | 1434.84  | -     |        |
| TOTAL | 43308.19             | 18448.46 | 2654.60            | 728.78 | 4788.67 | 1885.01  | 2061.11             | 626.77    | 2618.02                  | 8564.66  | -     | 932.11 |

\*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$7,371.00



## 1968 OPERATING COSTS

## TOTAL ANNUAL COST



## Yearly Operating Costs

| YEAR | M.G.TREATED | TOTAL COST  | COST PER MILLION GALLONS | COST PER LB OF BOD REMOVED |
|------|-------------|-------------|--------------------------|----------------------------|
| 1964 | 307.12      | \$29,738.15 | \$ 96.82                 | 10 cents                   |
| 1965 | 416.54      | 31,209.58   | 90.96                    | 10 cents                   |
| 1966 | 363.47      | 38,306.82   | 105.39                   | 15 cents                   |
| 1967 | 650.11      | 42,383.25   | 65.19                    | 9 cents                    |
| 1968 | 539.42      | 43,308.19   | 80.29                    | 11 cents                   |

## Process Data

The average daily flow decreased from 1.75 mgd in 1967 to 1.47 mgd in 1968. The average design flow of 1.50 mgd was exceeded only 56 percent of the time during the year as compared to 90 percent of the time in 1967.

The average raw sewage BOD and suspended solids concentrations were respectively 84 mg/l and 250 mg/l. The design BOD and suspended solids concentrations of 200 mg/l for each was exceeded only seven percent of the time for BOD and 20 percent of the time for suspended solids during the year.

The difference in the average concentrations of BOD and suspended solids in the raw sewage indicates a higher than normal ratio of inert to organic material. This is due to clay wastes from two paper mills.

The average final effluent BOD concentration of 13 mg/l and suspended solids concentration of 11 mg/l were within the OWRC objectives of 15 mg/l for each. The effluent BOD and suspended solids concentration in the final effluent exceeded the OWRC objective 34 percent and 13 percent of the time respectively during the year.

## PLANT FLOWS and CHLORINATION

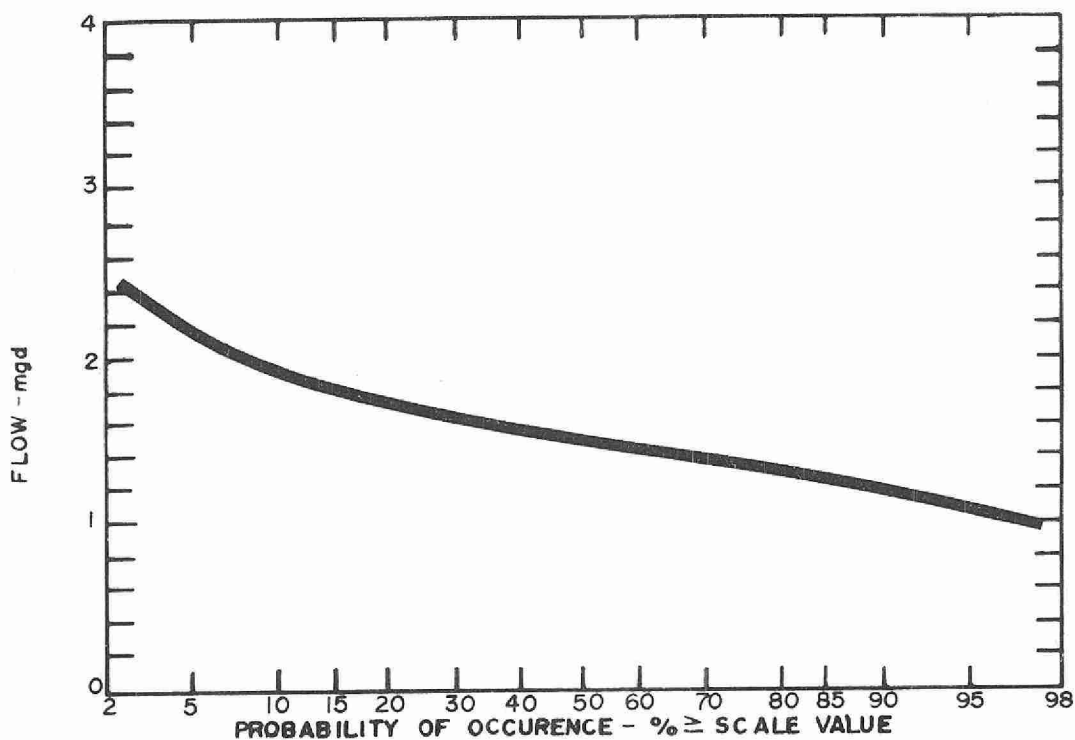
| MONTH   | TOTAL FLOW<br>mg | AVERAGE<br>DAILY FLOW<br>mg | MAXIMUM<br>DAILY FLOW<br>mg | MINIMUM<br>DAILY FLOW<br>mg | CHLORINE USED<br>lbs. | DOSAGE<br>mg/l |
|---------|------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------|----------------|
| JAN     | 45.95            | 1.48                        | 2.28                        | 1.31                        | 806                   | 1.9            |
| FEB     | 51.48            | 1.78                        | 3.28                        | 13.8                        | 984                   | 1.9            |
| MAR     | 60.50            | 1.95                        | 2.61                        | 1.46                        | 1032                  | 1.7            |
| APR     | 50.00            | 1.67                        | 2.20                        | 1.40                        | 954                   | 1.9            |
| MAY     | 50.74            | 1.64                        | 2.00                        | 1.41                        | 949                   | 1.9            |
| JUN     | 40.65            | 1.36                        | 2.14                        | .85                         | 1031                  | 2.5            |
| JUL     | * 33.14          | 1.07                        | 1.27                        | .89                         | 1207                  | 3.6            |
| AUG     | 41.02            | 1.32                        | 1.90                        | .80                         | 1131                  | 2.8            |
| SEPT    | 41.07            | 1.37                        | 2.04                        | 1.20                        | 1060                  | 2.6            |
| OCT     | 39.55            | 1.28                        | 1.86                        | 1.07                        | 1094                  | 2.8            |
| NOV     | 40.95            | 1.36                        | 2.24                        | .85                         | 1062                  | 2.6            |
| DEC     | 44.37            | 1.43                        | 2.43                        | 1.07                        | 1129                  | 2.5            |
| TOTAL   | 539.42           | -                           | -                           | -                           | 12439                 | -              |
| AVERAGE | -                | 1.47                        | -                           | -                           | 1037                  | 2.3            |

\* Prorated on 21 days data

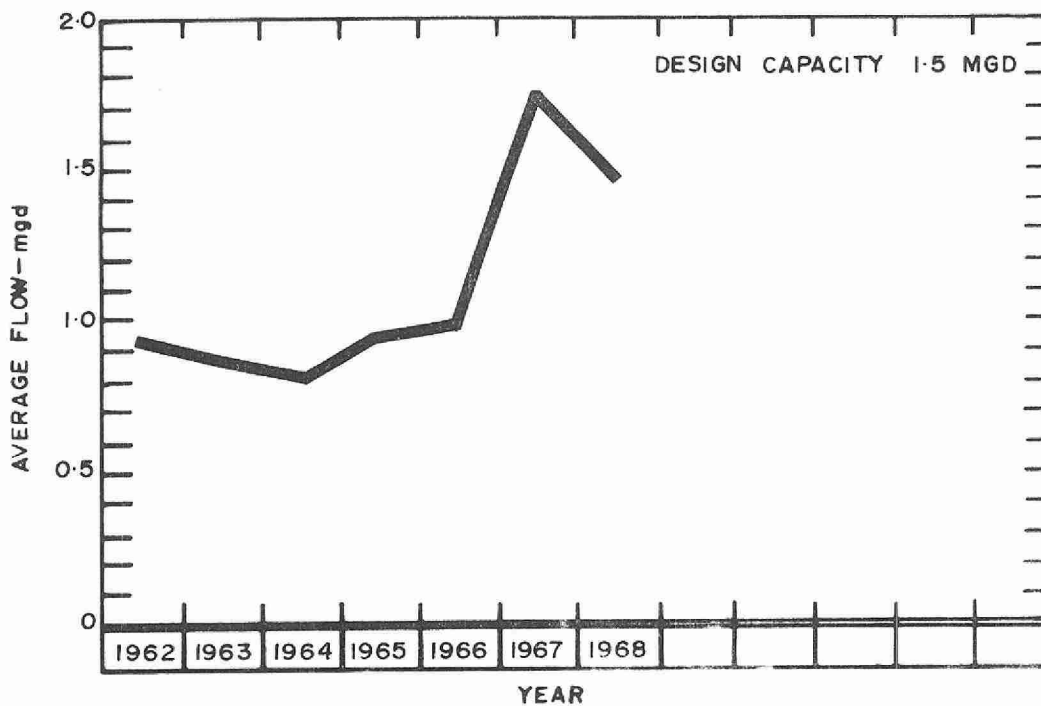
### COMMENTS

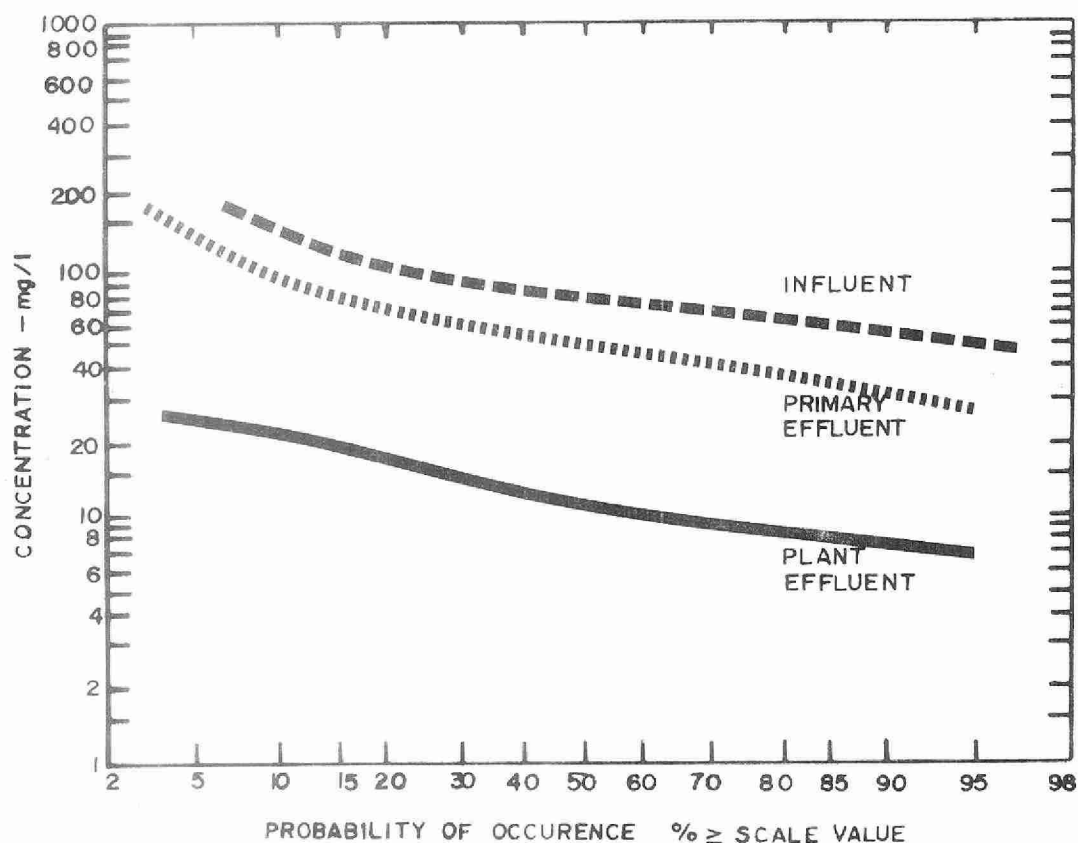
A total of 1,037 lbs. of chlorine at an average dosage rate of 2.3 mg/l was required to maintain a chlorine residual of 0.5 mg/l in the final effluent.

The flow meter was repaired after readings approximately 25% low were obtained prior to the fall of 1967. Steps have been taken to provide separated sewers, resulting in a decrease in total flows in 1968.

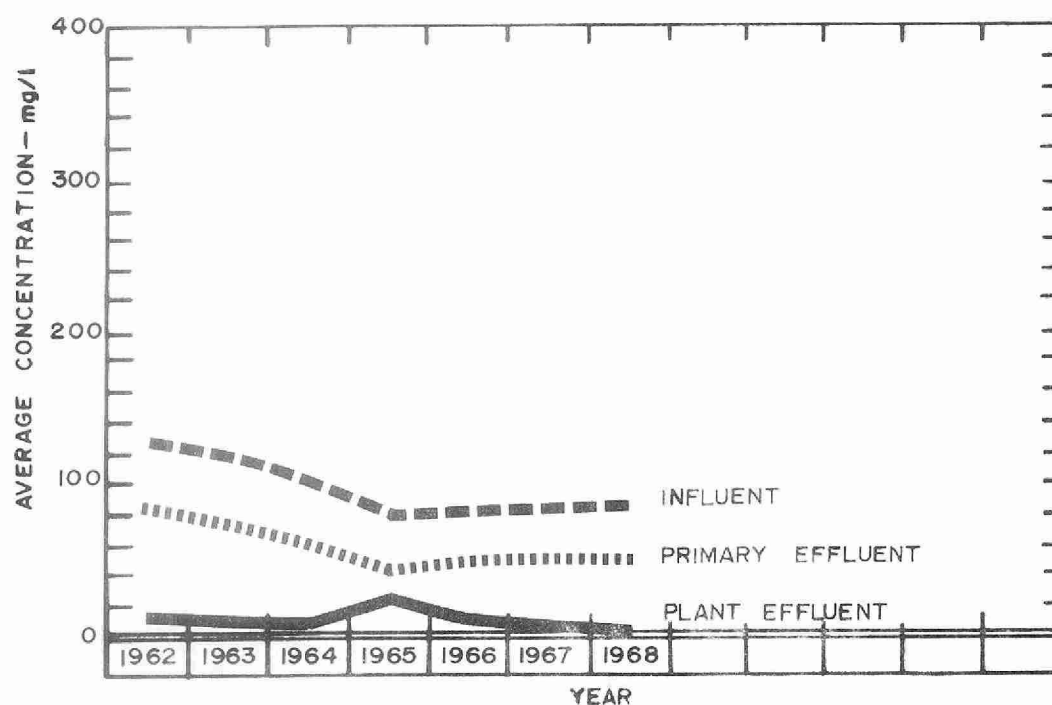


## **FL O W S**

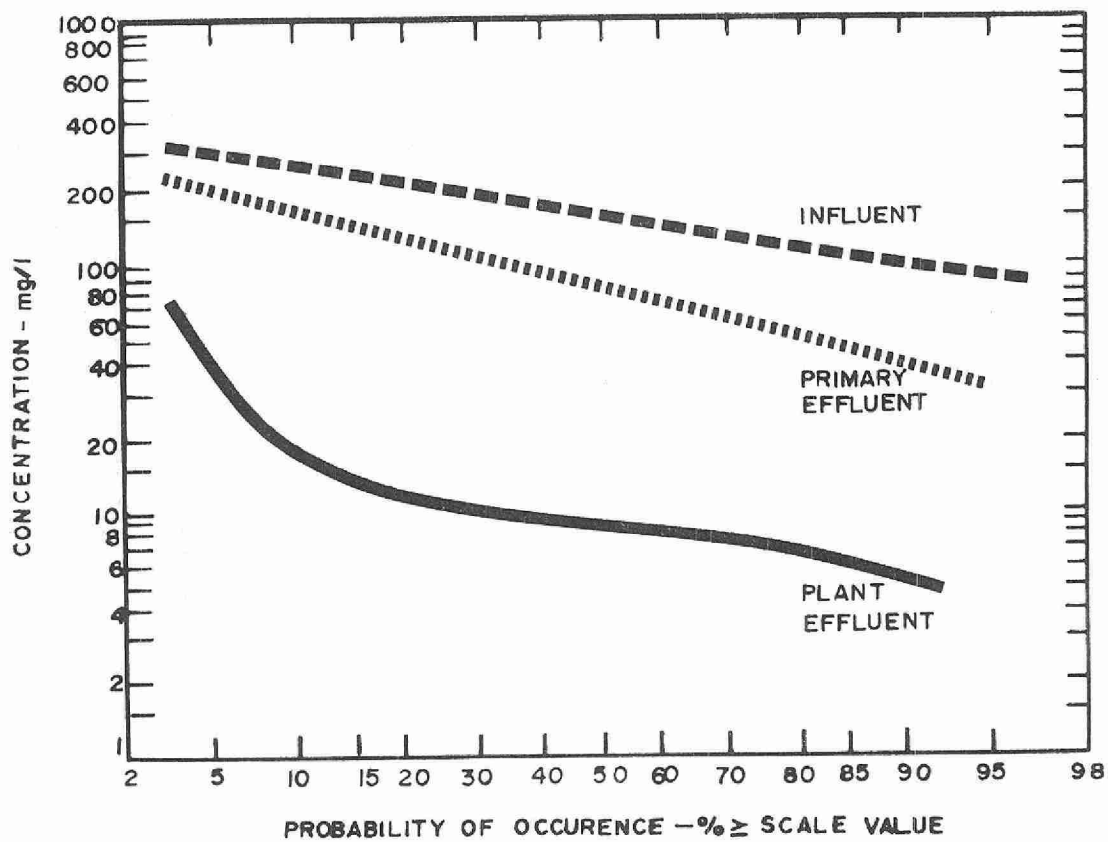




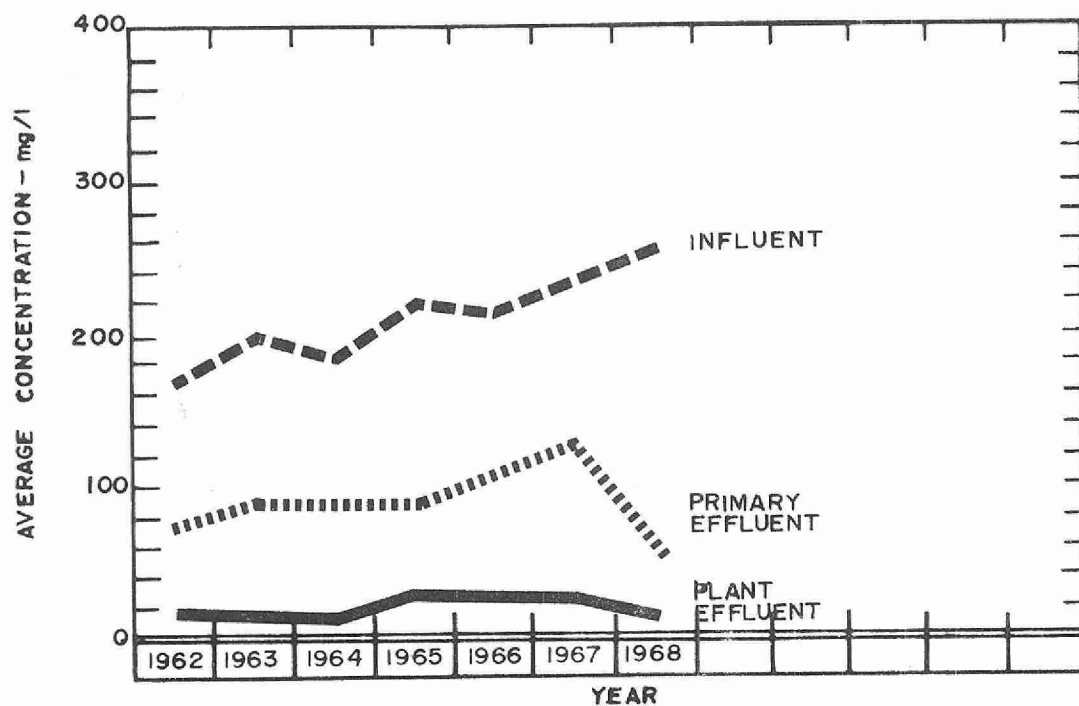
## BIOCHEMICAL OXYGEN DEMAND







## SUSPENDED SOLIDS



## PLANT EFFICIENCY

| MONTH   | BIOCHEMICAL OXYGEN DEMAND        |                                  |                       |                                  | SUSPENDED SOLIDS                 |                                  |                       |                                  | GRIT                       |
|---------|----------------------------------|----------------------------------|-----------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------|----------------------------------|----------------------------|
|         | INF<br>CONC <sup>N</sup><br>mg/l | EFF<br>CONC <sup>N</sup><br>mg/l | RED <sup>N</sup><br>% | REMOVAL<br>10 <sup>3</sup><br>lb | INF<br>CONC <sup>N</sup><br>mg/l | EFF<br>CONC <sup>N</sup><br>mg/l | RED <sup>N</sup><br>% | REMOVAL<br>10 <sup>3</sup><br>lb | REMOVAL<br>ft <sup>3</sup> |
| JAN     | 77                               | 22                               | 71                    | 25.3                             | 189                              | 13                               | 93                    | 80.9                             | 25                         |
| FEB     | 93                               | 20                               | 78                    | 37.5                             | 171                              | 15                               | 91                    | 80.3                             | 45                         |
| MAR     | 101                              | 20                               | 80                    | 49.0                             | 141                              | 8                                | 94                    | 80.5                             | 17                         |
| APR     | 109                              | 9                                | 92                    | 50.0                             | 112                              | 5                                | 96                    | 53.5                             | 14                         |
| MAY     | 105                              | 10                               | 90                    | 48.2                             | 199                              | 5                                | 98                    | 98.4                             | 27                         |
| JUN     | 74                               | 9                                | 88                    | 26.4                             | 130                              | 5                                | 96                    | 50.8                             | 26                         |
| JULY    | 68                               | 8                                | 88                    | 19.8                             | 167                              | 7                                | 96                    | 53.0                             | 20                         |
| AUG     | 48                               | 9                                | 81                    | 16.0                             | 63                               | 6                                | 90                    | 23.4                             | 59                         |
| SEPT    | 76                               | 11                               | 86                    | 26.7                             | 137                              | 40                               | 71                    | 39.8                             | 12                         |
| OCT     | 65                               | 8                                | 88                    | 22.7                             | 177                              | 5                                | 97                    | 68.0                             | -                          |
| NOV     | 123                              | 14                               | 89                    | 44.6                             | 134                              | 5                                | 96                    | 52.8                             | 54                         |
| DEC     | 66                               | 10                               | 85                    | 24.8                             | 104                              | 11                               | 89                    | 41.3                             | 6                          |
| TOTAL   | -                                | -                                | -                     | 391.1                            | -                                | -                                | -                     | 722.7                            | -                          |
| AVERAGE | 84                               | 13                               | 84                    | 32.5                             | 250                              | 11                               | 96                    | 60.2                             | 28                         |

### COMMENTS

Plant efficiency improved from 1967 to 1968 with respect to suspended solids reductions. The average final effluent suspended solids concentration was reduced from 23 mg/l in 1967 to 11 mg/l in 1968. The overall average suspended solids reduction increased from 89.7 percent to 96 percent.

The BOD reductions were similar to the reductions experienced in the previous year.

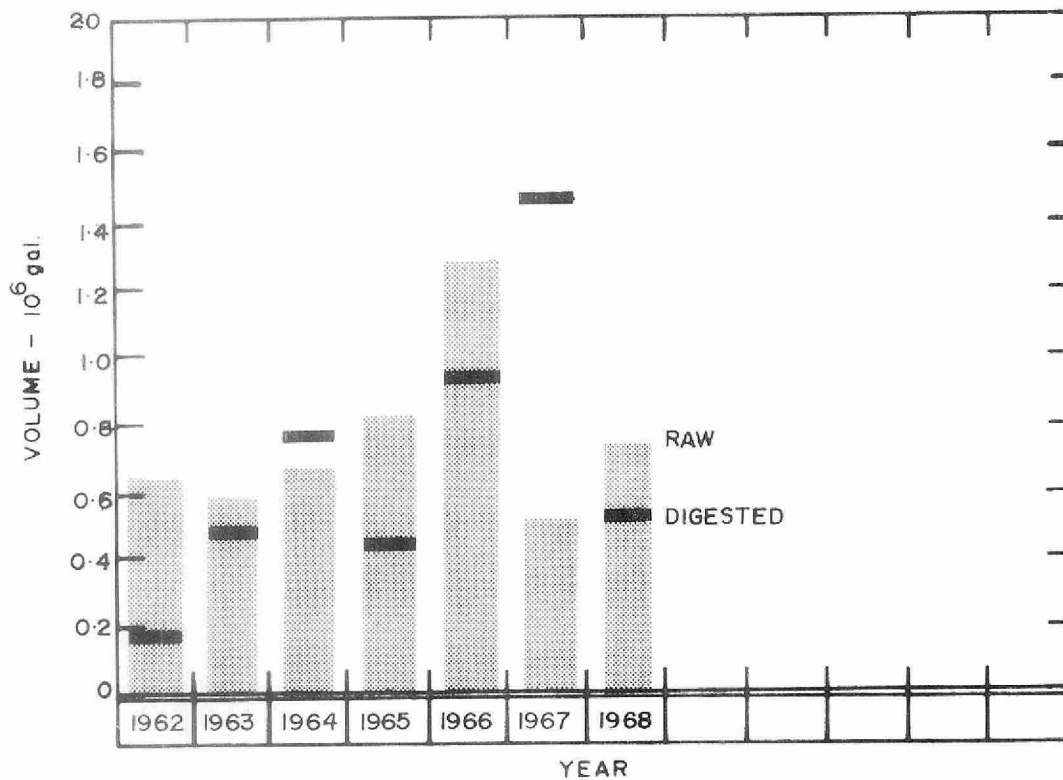
# AERATION

| MONTH   | AVERAGE<br>FLOW<br>mgd | PRIMARY EFF                      |                                 | SECONDARY EFF                    |                                 | MLSS<br>CONC <sup>N</sup><br>mg/l | F/M<br>$\left(\frac{\text{lb BOD}}{\text{lb MLSS}}\right)$ | *<br>AIR USED<br>$\left(\frac{1000 \text{ ft}^3}{\text{lb BOD}}\right)$<br>REMOVED | WASTE<br>SLUDGE<br>lb |
|---------|------------------------|----------------------------------|---------------------------------|----------------------------------|---------------------------------|-----------------------------------|--|--|-----------------------|
|         |                        | BOD<br>CONC <sup>N</sup><br>mg/l | SS<br>CONC <sup>N</sup><br>mg/l | BOD<br>CONC <sup>N</sup><br>mg/l | SS<br>CONC <sup>N</sup><br>mg/l |                                   |  |  |                       |
| JAN     | 1.48                   | 67                               | 111                             | 22                               | 13                              | 1,890                             | .12  | -  | -                     |
| FEB     | 1.78                   | 101                              | 150                             | 20                               | 15                              | 1,840                             | .18  | -  | -                     |
| MAR     | 1.95                   | 77                               | 90                              | 20                               | 8                               | 1,440                             | .20  | -  | -                     |
| APRIL   | 1.67                   | 61                               | 64                              | 9                                | 5                               | 1,540                             | .26  | -  | -                     |
| MAY     | 1.64                   | 62                               | 124                             | 10                               | 5                               | 1,270                             | .15  | -  | -                     |
| JUN     | 1.36                   | 26                               | 34                              | 9                                | 5                               | 1,330                             | .05  | -  | -                     |
| JUL     | 1.07                   | 35                               | 61                              | 8                                | 7                               | 1,140                             | .06  | -  | -                     |
| AUG     | 1.32                   | 48                               | 68                              | 9                                | 6                               | 2,550                             | .05  | -  | -                     |
| SEPT    | 1.37                   | 36                               | 65                              | 11                               | 40                              | 2,070                             | .04  | -  | -                     |
| OCT     | 1.28                   | 32                               | 56                              | 8                                | 5                               | 1,340                             | .05  | -  | -                     |
| NOV     | 1.36                   | 78                               | 49                              | 14                               | 5                               | 1,340                             | .15  | -  | -                     |
| DEC     | 1.43                   | 26                               | 40                              | 10                               | 11                              | 1,750                             | .04  | -  | -                     |
| TOTAL   | -                      | -                                | -                               | -                                | -                               | -                                 | -  | -  | -                     |
| AVERAGE | 1.47                   | 54                               | 76                              | 12                               | 10                              | 1,625                             | .11  | -  | -                     |

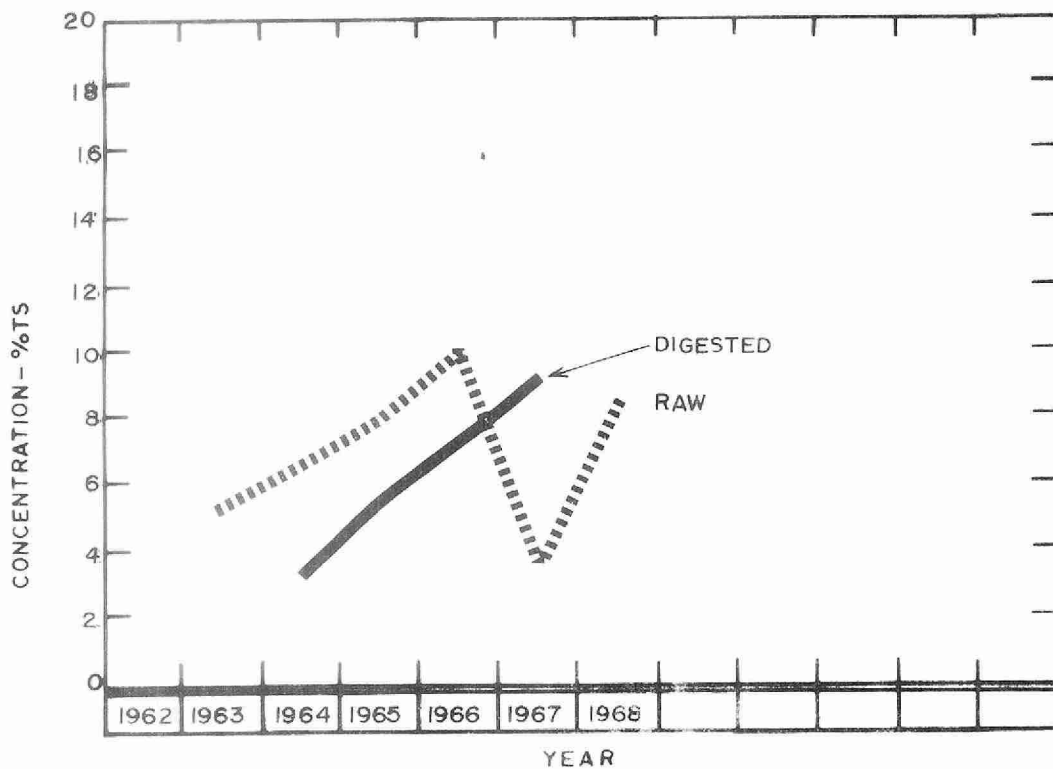
\* mechanical aeration

## COMMENTS

The average loading on the aeration section was similar to the loading experienced in the previous year at 0.11 lbs. of BOD per lb. of MLSS. Excellent treatment was obtained at this loading throughout the year.



## DIGESTION



## SLUDGE DIGESTION and DISPOSAL

| MONTH   | RAW SLUDGE            |            |            | DIGESTED SLUDGE                  |            |            | SUPERNATANT   |            | SLUDGE DISPOSAL           |                              |
|---------|-----------------------|------------|------------|----------------------------------|------------|------------|---------------|------------|---------------------------|------------------------------|
|         | VOLUME<br>1000<br>gal | T. S.<br>% | V. S.<br>% | VOLUME<br>10 <sup>5</sup><br>gal | T. S.<br>% | V. S.<br>% | VOLUME<br>gal | T. S.<br>% | LIQUID<br>yd <sup>3</sup> | DEWATERED<br>yd <sup>3</sup> |
| JAN     | -                     | -          | -          | 0                                | -          | -          | -             | -          | 0                         | 0                            |
| FEB     | -                     | -          | -          | 0                                | -          | -          | -             | -          | 477                       | 0                            |
| MAR     | -                     | 11.7       | 48         | 0                                | -          | -          | -             | -          | 612                       | 0                            |
| APR     | -                     | 6.0        | 61         | 0                                | -          | -          | -             | -          | 1080                      | 0                            |
| MAY     | -                     | 7.7        | 62         | 1.87                             | -          | -          | -             | -          | 1107                      | 0                            |
| JUN     | -                     | 6.4        | 55         | .97                              | -          | -          | -             | -          | 576                       | 0                            |
| JUL     | -                     | -          | -          | 1.06                             | -          | -          | -             | -          | 630                       | 0                            |
| AUG     | -                     | -          | -          | 1.20                             | -          | -          | -             | -          | 711                       | 0                            |
| SEPT    | -                     | -          | -          | 0                                | -          | -          | -             | -          | 522                       | 0                            |
| OCT     | -                     | 7.8        | 54         | 0                                | -          | -          | -             | -          | 720                       | 0                            |
| NOV     | -                     | 7.0        | 44         | 0                                | -          | -          | -             | -          | 621                       | 0                            |
| DEC     | -                     | 10.0       | 55         | 0                                | -          | -          | -             | -          | 369                       | 0                            |
| TOTAL   | * 660                 | -          | -          | 5.10                             | -          | -          | -             | -          | 7425                      | 0                            |
| AVERAGE | -                     | 8.1        | 54         | 0                                | -          | -          | -             | -          | 675                       | 0                            |

\*Estimated

### COMMENTS

Because of problems with the operation of the digester, sludge digestion was carried out only for four months of the year. During the other months, raw sludge was hauled directly from the primary tanks.

A heavy sludge in the digester, consisting mostly of clay wastes, prohibited effective digester operation. An attempt to empty the digester during the summer was unsuccessful as the pump was incapable of handling the heavy sludge. A new pump has been ordered to overcome this situation.

Date Due

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
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TD227/G46/W38/1968/MOE /  
 Ontario Water Resources Co  
 Georgetown water  
 pollution control plant: asxr  
 operating summary c.1 a aa  
 1968

Environment Ontario



Laboratory Library  
 125 Resources Rd.  
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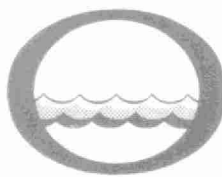
## **CONCLUSIONS**

An average flow of 1.47 mgd was treated at the plant during the year. This represented a flow equal to 98 percent of the plant design capacity.

The average final effluent, BOD and suspended solids concentrations of 13 mg/l and 11 mg/l respectively were within the OWRC objectives of 15 mg/l for each.

## **RECOMMENDATIONS**

Expansion should be initiated in the near future.



*Water management in Ontario*